Amendments to the Claims

1 (Currently Amended). A method for determining how much margin there is in a design of an optical span, said method comprising the steps of:

designing an operable optical span;

performing a margin analysis on said operable optical span to determine how much change said operable optical span can tolerate before said operable optical span becomes an inoperable optical span; and

determining a margin limit for the optical span equal to the tolerated change.

2 (Original). The method of Claim 1, further comprising the step of presenting the results of the margin analysis to a user.

3 (Original). The method of Claim 1, wherein said step of designing an operable optical span further includes selecting components that make-up the optical span.

4 (Original). The method of Claim 1, wherein said step of performing a margin analysis on said operable optical span further includes making a continuing series of user-defined changes to the design of said operable optical span and analyzing the changed design after each iteration of a user-defined change to determine when the changed design fails to meet a minimum performance criteria.

5 (Original). The method of Claim 4, wherein said minimum performance criteria is an optical signal noise ratio or a received power value.

6 (Currently Amended). The method of Claim 1, wherein said step of performing a margin analysis on said operable optical span further includes in a first case type, determining an

allowable amount of change that can be made in a position of an in-line amplifier relative to adjacent in-line amplifiers.

7 (Currently Amended). The method of Claim 1, wherein said step of performing a margin analysis on said operable optical span further includes in a second case type, determining an allowable amount of change that can be made to the lengths of all segments of fiber optic cables.

8 (Currently Amended). The method of Claim 1, wherein said step of performing a margin analysis on said operable optical span further includes in a third case type, determining an allowable amount of change that can be made in one segment of fiber optic cable when there are no changes made to the remaining segments of fiber optic cables.

9 (Currently Amended). The method of Claim 1, wherein said step of performing a margin analysis on said operable optical span further includes in a fourth case type, determining how many channels can be tolerated by the design of the optical span.

10 (Currently Amended). An optical route design system, comprising:

a processor capable of determining whether a design of an optical span is an operable optical span and further capable of performing a margin analysis on said operable optical span to determine how much change said operable optical span can tolerate before said operable optical span becomes an inoperable optical span in a plurality of case types; and

a display, coupled to said processor, capable of presenting the results of the margin analysis to a user.

11 (Original). The optical route design system of Claim 10, further comprising a database capable of storing information about components that can be selected by the user to make-up the optical span.

12 (Original). The optical route design system of Claim 10, wherein said processor in performing a margin analysis on the operable optical span is capable of making a continuing series of user-defined changes to the design of said operable optical span and analyzing the changed design after each iteration of a user-defined change to determine when the changed design fails to meet a minimum performance criteria.

13 (Original). The optical route design system of Claim 12, wherein said minimum performance criteria is an optical signal noise ratio or a received power value.

14 (Currently Amended). The optical route design system of Claim 10, wherein said processor in performing a margin analysis on the operable optical span is capable of determining in one of the plurality of case types an allowable amount of change that can be made in a position of an in-line amplifier relative to adjacent in-line amplifiers.

15 (Currently Amended). The optical route design system of Claim 10, wherein said processor in performing a margin analysis on the operable optical span is capable of determining in one of the plurality of case types an allowable amount of change that can be made to lengths of all segments of fiber optic cables.

16 (Currently Amended). The optical route design system of Claim 10, wherein said processor in performing a margin analysis on the operable optical span is capable of determining in one of the plurality of case types an allowable amount of change that can be made in one segment of fiber optic cable when there are no changes made to the remaining segments of fiber optic cables.

17 (Currently Amended). The optical route design system of Claim 10, wherein said processor in performing a margin analysis on the operable optical span is capable of determining

in one of the plurality of case types how many channels can be tolerated by the design of the optical span.

18 (Currently Amended). A method for analyzing the performance of a design of an optical span, said method comprising the steps of:

selecting components that make-up the optical span;

optimizing the optical span to make an operable optical span;

performing a margin analysis on said operable optical span to determine how much change said operable optical span can tolerate in a plurality of case types before said operable optical span becomes an inoperable optical span, wherein said step of performing a margin analysis on said operable optical span further includes the steps of:

receiving at least one parameter identifying incremental changes that are to be made to said operable optical span;

incorporating an incremental change into at least one component of said operable optical span in accordance with a case type;

analyzing the changed optical span;

determining whether the changed optical span is an operable optical span;

determining whether all of the components of the optical span and all of the case types have been analyzed; and

presenting the results of the margin analysis to a user.

19 (Original). The method of Claim 18, wherein said step of optimizing the optical span to make an operable optical span further includes the steps of:

analyzing the design of the optical span;

determining whether the design of the optical span is an operable optical span; and

if not, analyzing a received signal spectrum and adjusting a transmitted signal spectrum to improve the characteristics of the received signal spectrum, wherein the received signal

spectrum is continually analyzed and the transmitted signal spectrum is continually adjusted until there is an operable optical span.

20 (Currently Amended). The method of Claim 18, wherein said step of ~~performing a margin analysis on said operable optical span further includes the steps of:~~

~~receiving at least one parameter identifying incremental changes that are to be made to said operable optical span;~~

~~incorporating an incremental change into at least one component of said operable optical span in accordance with a case type;~~

~~analyzing the changed optical span;~~

determining whether the changed optical span is an operable optical span further includes the steps of: ;

if yes, incorporating the next incremental change into the at least one component of said optical span in accordance with the case type and repeating the analyzing step and the determining step until the changed optical span is no longer an operable optical span;

if not, identifying the previous incremental change as a margin limit for the at least one component in accordance with the case type; and

wherein said step of determining whether all of the components of the optical span and all of the case types have been analyzed further includes the steps of: ;

if not, incorporating an incremental change into the next at least one component of said operable optical span in accordance with the case type and repeating the analyzing step and the two determining steps until all of the components of the optical span and all of the case types have been analyzed;

if yes, organizing the results of the margin limits.

21 (Original). The method of Claim 20, wherein the case type is a sensitivity case during which there is determined an allowable amount of change in a position of an in-line amplifier relative to adjacent in-line amplifiers.

22 (Original). The method of Claim 20, wherein the case type is a simultaneous case during which there is determined an allowable amount of change that can be made to the lengths of all segments of fiber optic cables.

23 (Original). The method of Claim 20, wherein the case type is an independent case during which there is determined an allowable amount of change that can be made in one segment of fiber optic cable when there are no changes made to the remaining segments of fiber optic cables.

24 (Original). The method of Claim 20, wherein the case type is a channel case during which there is determined how many channels can be tolerated by the design of the optical span.